

Polar™ Power MOSFET
HiPerFET™
IXFN40N90P

 N-Channel Enhancement Mode
 Avalanche Rated
 Fast Intrinsic Diode

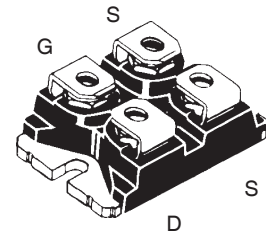

$$V_{DSS} = 900V$$

$$I_{D25} = 33A$$

$$R_{DS(on)} \leq 210m\Omega$$

$$t_{rr} \leq 300ns$$

Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	$T_J = 25^\circ C$ to $150^\circ C$	900	V
V_{DGR}	$T_J = 25^\circ C$ to $150^\circ C$, $R_{GS} = 1M\Omega$	900	V
V_{GSS}	Continuous	± 30	V
V_{GSM}	Transient	± 40	V
I_{D25}	$T_C = 25^\circ C$	33	A
I_{DM}	$T_C = 25^\circ C$, pulse width limited by T_{JM}	80	A
I_A	$T_C = 25^\circ C$	20	A
E_{AS}	$T_C = 25^\circ C$	1.5	J
dV/dt	$I_S \leq I_{DM}$, $V_{DD} \leq V_{DSS}$, $T_J \leq 150^\circ C$	20	V/ns
P_D	$T_C = 25^\circ C$	695	W
T_J		-55 ... +150	$^\circ C$
T_{JM}		150	$^\circ C$
T_{stg}		-55 ... +150	$^\circ C$
T_L	1.6mm (0.062 in.) from case for 10s	300	$^\circ C$
V_{ISOL}	50/60 Hz, RMS $I_{ISOL} \leq 1mA$	$t = 1min$ $t = 1s$	2500 3000 V~ V~
M_d	Mounting torque Terminal connection torque	1.5/13 1.3/11.5	Nm/lb.in. Nm/lb.in.
Weight		30	g

 miniBLOC, SOT-227
 E153432

 G = Gate
 S = Source
 D = Drain

Either Source terminal S can be used as the Source terminal or the Kelvin Source (gate return) terminal.

Features

- International standard package
- miniBLOC, with Aluminium nitride isolation
- Avalanche Rated
- Low package inductance
- Fast intrinsic diode

Advantages

- Low gate drive requirement
- High power density

Applications:

- Switched-mode and resonant-mode power supplies
- DC-DC Converters
- Laser Drivers
- AC and DC motor drives
- Robotics and servo controls

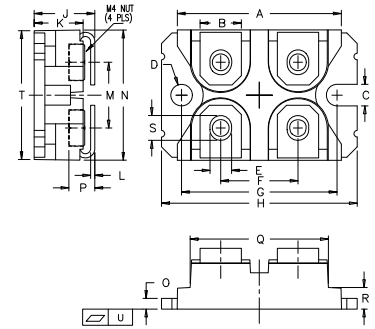
Symbol	Test Conditions ($T_J = 25^\circ C$, unless otherwise specified)	Characteristic Values		
		Min.	Typ.	Max.
BV_{DSS}	$V_{GS} = 0V$, $I_D = 3mA$	900		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 1mA$	3.5		6.5 V
I_{GSS}	$V_{GS} = \pm 30V$, $V_{DS} = 0V$			± 200 nA
I_{DSS}	$V_{DS} = V_{DSS}$ $V_{GS} = 0V$ $T_J = 125^\circ C$			50 μA 3 mA
$R_{DS(on)}$	$V_{GS} = 10V$, $I_D = 20A$, Note 1			210 m Ω

Symbol	Test Conditions ($T_J = 25^\circ\text{C}$ unless otherwise specified)	Characteristic Values		
		Min.	Typ.	Max.
g_{fs}	$V_{DS} = 20\text{V}, I_D = 20\text{A}$, Note 1	18	30	S
R_{Gi}	Gate input resistance		1.5	Ω
C_{iss}	$V_{GS} = 0\text{V}, V_{DS} = 25\text{V}, f = 1\text{MHz}$		14	nF
C_{oss}			896	pF
C_{rss}			58	pF
$t_{d(on)}$	Resistive Switching Times $V_{GS} = 10\text{V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 20\text{A}$ $R_G = 1\Omega$ (External)		53	ns
t_r			50	ns
$t_{d(off)}$			77	ns
t_f			46	ns
$Q_{g(on)}$	$V_{GS} = 10\text{V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 20\text{A}$		230	nC
Q_{gs}			70	nC
Q_{gd}			100	nC
R_{thJC}				0.18 $^\circ\text{C/W}$
R_{thCS}		0.05		$^\circ\text{C/W}$

Symbol	Test Conditions ($T_J = 25^\circ\text{C}$ unless otherwise specified)	Characteristic Values		
		Min.	Typ.	Max.
I_S	$V_{GS} = 0\text{V}$			40 A
I_{SM}	Repetitive, pulse width limited by T_{JM}			160 A
V_{SD}	$I_F = I_S, V_{GS} = 0\text{V}$, Note 1			1.5 V
t_{rr}	$I_F = 20\text{A}, -di/dt = 100\text{A}/\mu\text{s}$ $V_R = 100\text{V}$			300 ns
Q_{RM}			1.7	μC
I_{RM}			14	A

Note 1: Pulse test, $t \leq 300\mu\text{s}$; duty cycle, $d \leq 2\%$.

SOT-227B Outline



SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	1.240	1.255	31.50	31.88
B	.307	.323	7.80	8.20
C	.161	.169	4.09	4.29
D	.161	.169	4.09	4.29
E	.161	.169	4.09	4.29
F	.587	.595	14.91	15.11
G	1.186	1.193	30.12	30.30
H	1.496	1.505	38.00	38.23
J	.460	.481	11.68	12.22
K	.351	.378	8.92	9.60
L	.030	.033	0.76	0.84
M	.496	.506	12.60	12.85
N	.990	1.001	25.15	25.42
O	.078	.084	1.98	2.13
P	.195	.235	4.95	5.97
Q	1.045	1.059	26.54	26.90
R	.155	.174	3.94	4.42
S	.186	.191	4.72	4.85
T	.968	.987	24.59	25.07
U	-.002	.004	-0.05	0.1

PRELIMINARY TECHNICAL INFORMATION

The product presented herein is under development. The Technical Specifications offered are derived from data gathered during objective characterizations of preliminary engineering lots; but also may yet contain some information supplied during a pre-production design evaluation. IXYS reserves the right to change limits, test conditions, and dimensions without notice.

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IXYS MOSFETs and IGBTs are covered by one or more of the following U.S. patents:	4,835,592	4,931,844	5,049,961	5,237,481	6,162,665	6,404,065 B1	6,683,344	6,727,585	7,005,734 B2	7,157,338B2
	4,850,072	5,017,508	5,063,307	5,381,025	6,259,123 B1	6,534,343	6,710,405 B2	6,759,692	7,063,975 B2	
	4,881,106	5,034,796	5,187,117	5,486,715	6,306,728 B1	6,583,505	6,710,463	6,771,478 B2	7,071,537	

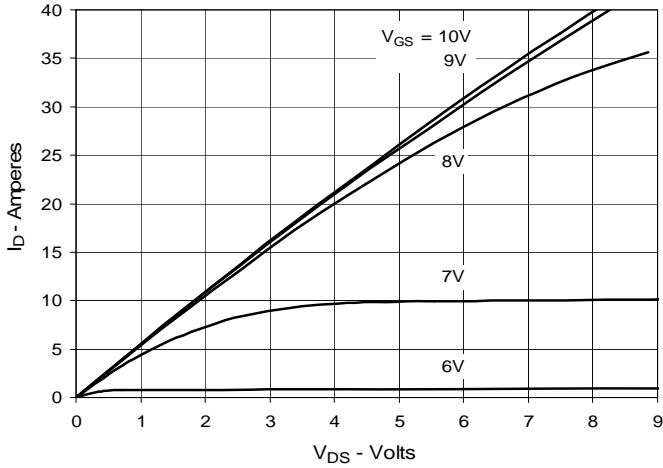
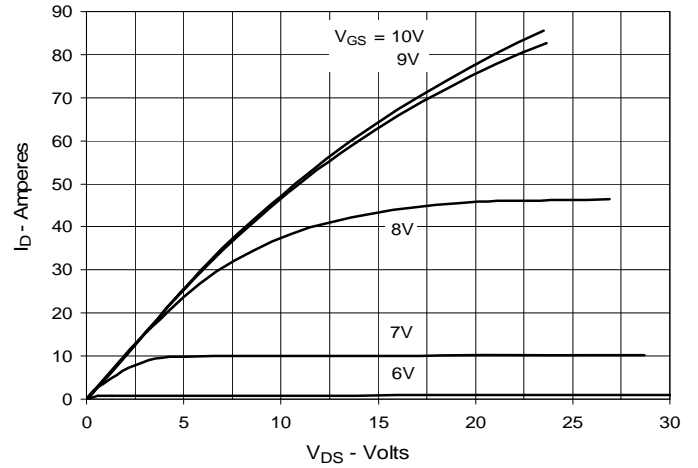
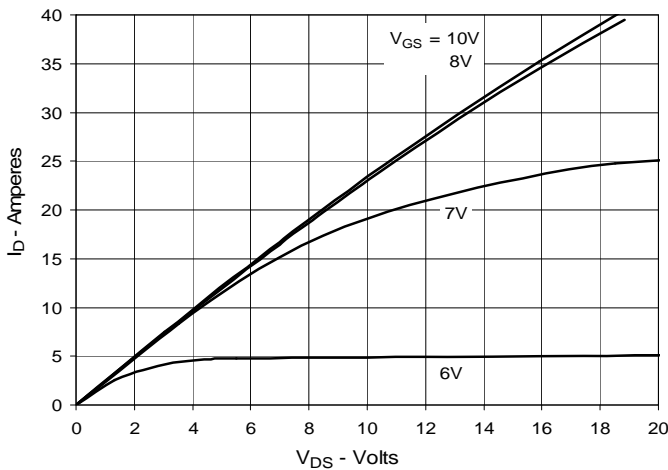
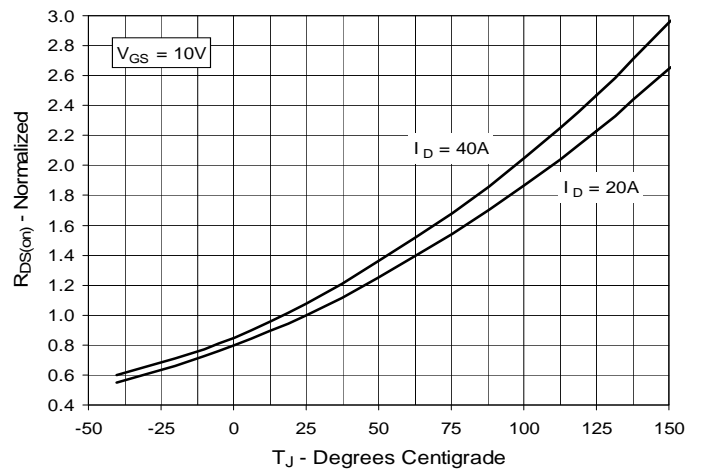
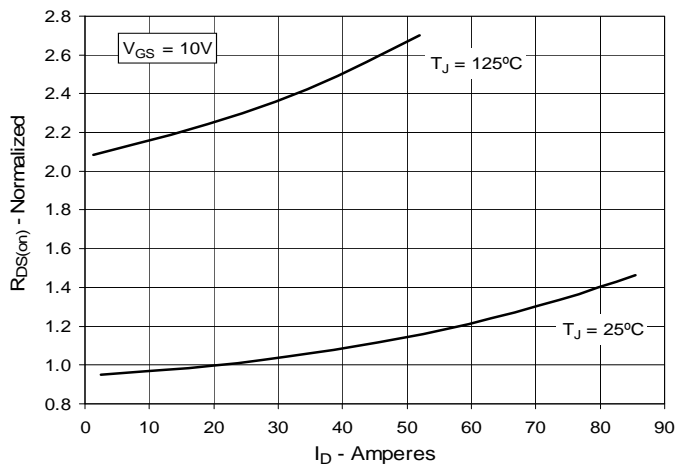
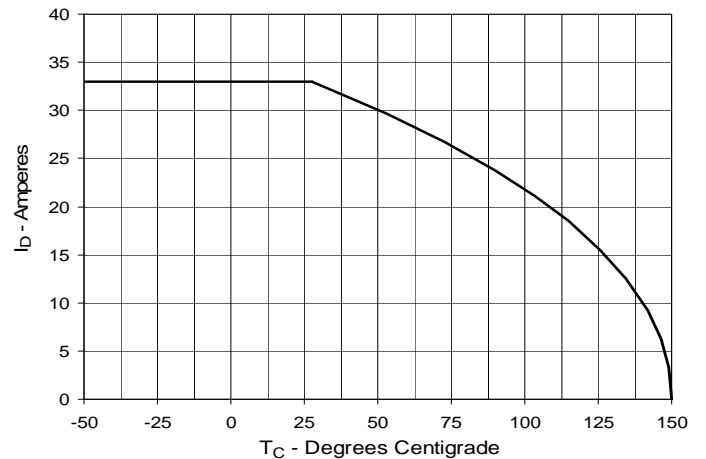
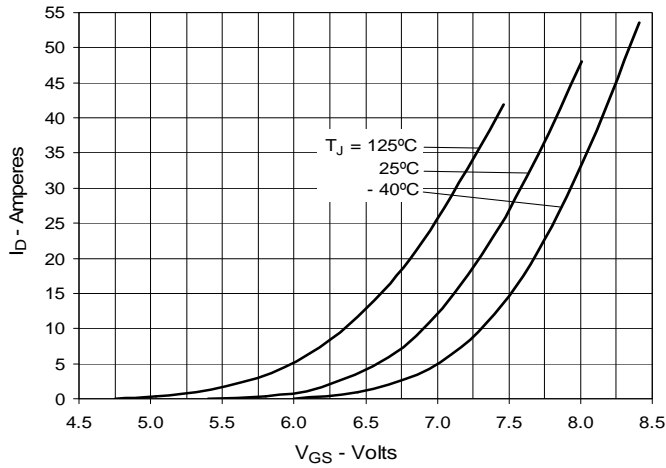
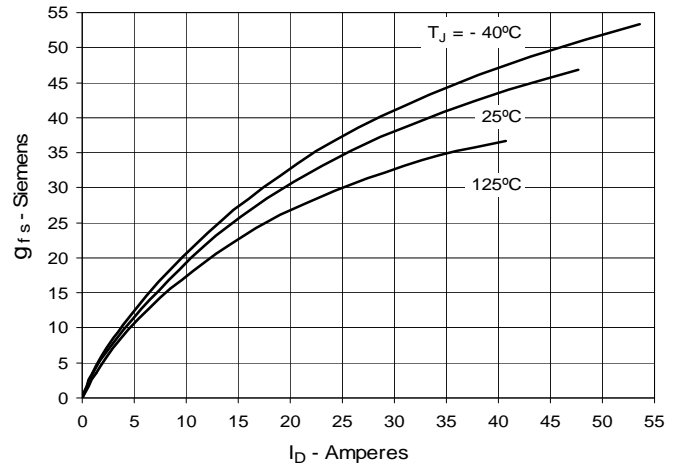
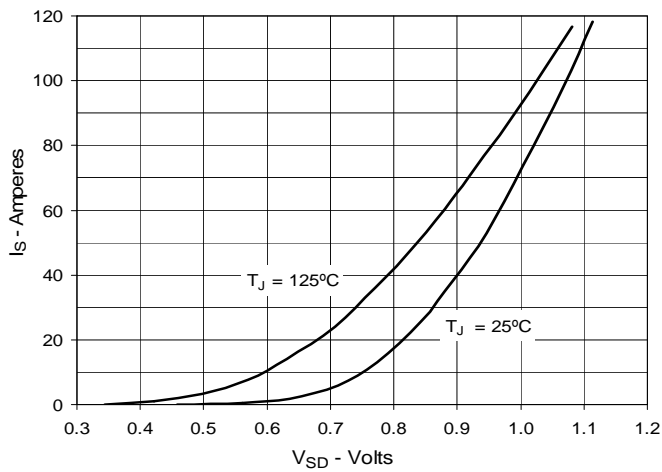
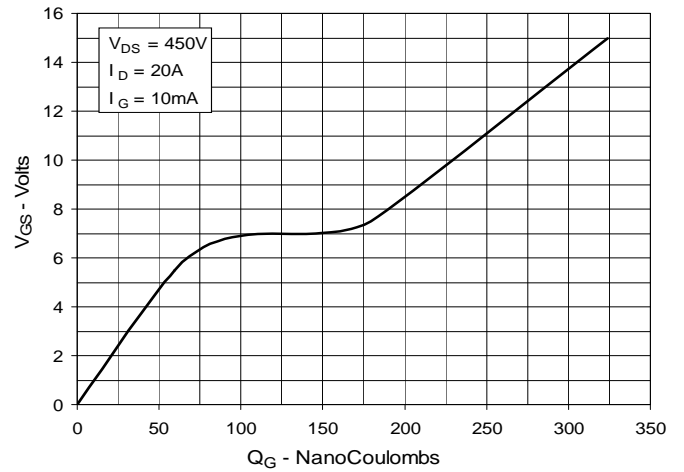
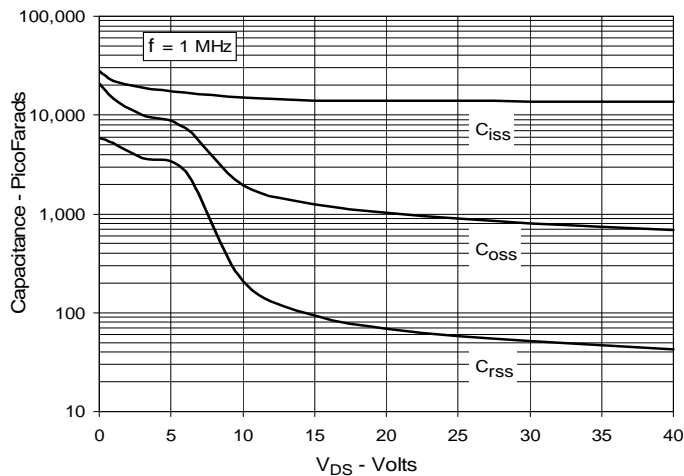
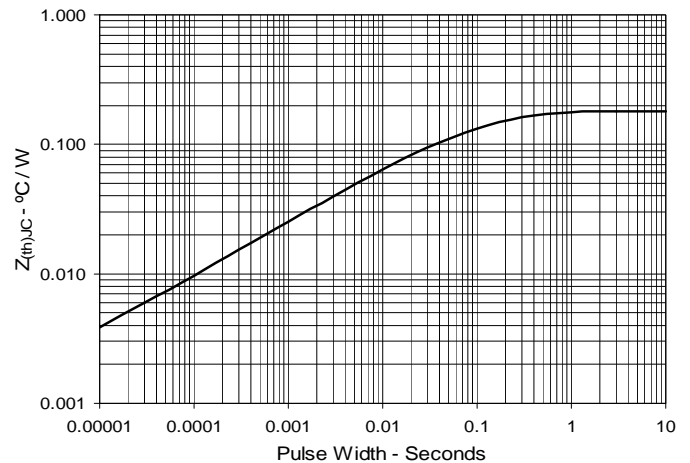
Fig. 1. Output Characteristics @ 25°C

Fig. 2. Extended Output Characteristics @ 25°C

Fig. 3. Output Characteristics @ 125°C

Fig. 4. $R_{DS(on)}$ Normalized to $I_D = 20A$ Value vs. Junction Temperature

Fig. 5. $R_{DS(on)}$ Normalized to $I_D = 20A$ Value vs. Drain Current

Fig. 6. Maximum Drain Current vs. Case Temperature


Fig. 7. Input Admittance

Fig. 8. Transconductance

Fig. 9. Forward Voltage Drop of Intrinsic Diode

Fig. 10. Gate Charge

Fig. 11. Capacitance

Fig. 12. Maximum Transient Thermal Impedance


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